

through wireless PBXs would be lost if the service was delayed because it is too expensive or because additional enhancements need to be developed.

In the case of wireless PBXs, Northern Telecom also believes that the Commission should not require the PBX to recognize or transmit the calls of unregistered portables. These should be viewed in the same light as an unwired telephone -- i.e., they do not exist as far as the PBX is concerned. They should not be able to make any calls, even to 911. To allow unregistered portable telephones to make any calls will potentially open up a Pandora's Box of potential toll fraud. A PBX is a private, closed system, and the owner must be permitted control over the equipment connected to it.

Another issue that is raised by wireless PBXs relates to how location information will be transmitted to the PSAP. Today's protocols (CAMA, ISDN) only allow the calling number (i.e., ANI) to be sent to the PSAP. Wireless PBX phones would presumably require the Base Station location to also be sent, since that information cannot merely be gleaned from a data base translation of the SNI. This need to transmit additional information to the PSAP raises complex issues requiring significant time to resolve.

Northern Telecom suggests referral of the issues raised by wireless PBXs to a negotiated rulemaking committee. At a minimum, the Commission should defer requiring Base Station location to be sent for at least five years in order to have time to resolve the technical hurdles. ISDN standards bodies (e.g. National ISDN NI-3) should also participate in this process to

formulate extensions to the protocol which will allow this and other pertinent E-911 information to be sent on ISDN calls. Requiring the PBX to transmit to the PSAP the location of the wireless PBX base station handling the 911 call should only be required a reasonable time after such standards are available. It would be unreasonable to attempt to modify CAMA technology (at significant cost) to perform this function on an interim basis.

Another complication that may arise if the requirements proposed for wireless services are engrafted onto wireless PBXs is priority Radio Frequency (RF) access. At the very least, these procedures would have to be defined by the appropriate standards bodies before priority access could be supported by wireless PBXs.^{28/}

VI. COMPATIBILITY OF WIRELESS SERVICES WITH E-911 SERVICES AND NETWORKS

A. Background

The Commission proposes to impose obligations on certain wireless services (tentatively defined as CMRS) so that they would emulate wired connections to E-911. That is, in addition to connecting with the PSAP, information on the location of the caller would also automatically be provided to the PSAP. The Commission proposes a phased implementation of the obligations,

^{28/} Given the general easy availability of non-wireless phones in an office environment (which is where wireless PBXs will be deployed) and the expected high cost of development of this capability, it is not even clear that priority queuing from the mobile handset to the wireless base station should be a requirement for wireless PBXs.

with more accurate information on location not being required for some time.

As a general matter, Northern Telecom agrees with the Commission that the utility of E-911 services would be enhanced by ensuring compatibility of wireless services. Indeed, some of the proposed requirements can readily and rapidly be implemented. However, many complicated technical obstacles remain before all of the proposals could be implemented. In order to best address these in a manner that will satisfy the interests of emergency services providers, wireless services providers, manufacturers and consumers, Northern Telecom suggests that the Commission convene a negotiated rulemaking committee to reach consensus on several of the issues.

While some delay in the availability of particular features may occur, Northern Telecom believes that the additional time would be well spent. As noted above, everyone benefits from the adoption of uniform standards rather than proprietary solutions. In addition, access to 911 services via portable handsets will continue to be available, even if the automatic location information is not. Northern Telecom believes that such "limited" access to 911 is better than no access at all, since the subscriber can talk with the PSAP and verbally provide the relevant information.

Moreover, if costly automatic location solutions are imposed, then the resulting high price of the services will retard individuals or businesses from signing up for wireless services, and not even "limited" access would be available.

Thus, a somewhat "cautious" approach for resolving the outstanding technical issues will serve to maximize the public interest. Bearing this goal in mind, Northern Telecom offers the following comments on the text of the E-911 NPRM.^{29/}

B. There is a Need for Adequate Time
to Develop Uniform, Open Standards

Northern Telecom agrees in principal with the Commission's goal that wireless systems serving the general public (i.e., CMRS) should provide access to E-911 that is the functional equivalent to wireline E-911 access. However, the Commission must bear in mind that wireless will need to use completely different system technologies than wireline. As a result, some of the proposed services or functionalities may not be universally achievable by the proposed deadlines.

Some niche technologies can improve E-911 access for some applications, but they presently require the use of proprietary technology.^{30/} Moreover, there does not yet appear to be a universal solution to the problems posed by wireless services' E-911 access. Northern Telecom does not believe that the public interest would be well served by merely spawning a proliferation of proprietary solutions.

^{29/} Perhaps reflecting the number of outstanding issues, the Commission did not propose specific rule text for wireless services like it did for PBXs.

^{30/} To the extent that use of any proprietary technologies is mandated by the Commission, it will also be necessary to ensure that other manufacturers will receive a license for that technology on reasonable terms.

Northern Telecom agrees that wireless equipment connected to the PSTN should be designed to accommodate E-911 calls. However, due to the wide variety of wireless systems and the different levels of embedded equipment, some systems may warrant different compliance deadlines. As the ultimate goal, CMRS systems that are used as an alternative or replacement for wireline equipment for the general public warrant a "Requirement" evolution that will eventually provide E-911 as good or better than wireline service. Adequate time must be provided to manufacturers and system operators to achieve that goal.

C. New Information and Transmission Requirements

The E-911 NPRM would impose some new obligations on CMRS providers. One requirement proposed in the E-911 NPRM is that mobile handsets must communicate callback (ANI) and location (ALI) information to the base station(s) handling the call to 911. As a corollary, the base station must be able to receive and interpret this transmitted information.

ANI is necessary to permit call back to the handset. Today many existing wireline switching and trunk systems to the PSAP are only designed to pass on eight (8) digits of information. To properly identify roamers' Directory Numbers (DNs) for call back capability, the system must be capable of transmitting ten (10) digits of information.

To provide location information (ALI) by longitude and latitude, an additional 12 to 14 digits will be required.

Moreover, additional information proposed in the NPRM for transport to the PSAP will need still more digit information. Clearly changes to the wireless and wireline networks will be necessary.

Northern Telecom believes that technical solutions are achievable. SS7 does provide the enhanced capability to transport additional E-911 information. However, the use of SS7 for signalling will also impact the PSAP equipment and its access connections. To achieve the E-911 goal, the FCC must also address the switch and trunk capacity design to the PSAP. It will not be productive for wireless manufacturers to design increased signalling information for capture and transport if the wireline connection is incapable of passing that data on to the PSAP. To achieve the E-911 goal and serve wireless users, a new protocol procedure or standards and dedicated line system to the PSAP would likely have to be deployed.

D. Location Information

ALI in the E-911 context is location information, and most wireless systems can identify the cell that is serving the wireless 911 call. Achieving a greater degree of accuracy as to the location of the mobile transceiver will be difficult, however. Although, there are numerous methods for identifying caller location that implement RF technology and can achieve more accuracy, presently there is not a preferred candidate that is effective for the multiple RF access and transport technologies

that are expected to be deployed, such as TDMA, CDMA, AMPS and PCS 2000.

There are numerous potential methods for identifying caller location with a greater degree of accuracy than knowing which base station is handling the call. Northern Telecom urges the FCC to use a negotiated rulemaking committee as a means of developing a consensus as to uniform and non-proprietary methods for future E-911 location requirements. Just as there is a need to avoid multiple and conflicting State Laws, there is a need to avoid multiple and conflicting methods to improve wireless E-911. PSAP's will not likely be capable of supporting a mix of incompatible location technologies. In addition, a common method will speed E-911 development and greatly reduce the cost to the consumer.

Northern Telecom is aware of a multitude of techniques and technologies for determining the location of the caller. In the immediate future, some of the location options include the following:

Fixed Location Information:

Some Cellular and PCS in-building microcell systems can be configured to identify which floor in a high rise building a 911 caller is on, if the caller is accessing a microcell. The use of in-building microcells for future 3-D location capacity may be more feasible and cost effective than designing systems to provide relative altitude from all mobiles.^{31/}

^{31/} In addition, in rural environments where high rises do not exist, there will be no benefit from determining the altitude since knowledge of the longitude and latitude will suffice.

Network Overlay (RF Based
Solution for Location Information):

RF Overlays may be possible in some cellular networks to identify the caller's location. Typically these network based location systems operate with one particular RF access technology. If location technology is deployed as a network based overlay, it should support multiple RF access technologies in order to minimize equipment costs. In addition, common standards would ensure compatibility between multiple networks and support mobile operation in different environments.

Handset Based Location Information:

Optional GPS chips in mobile radios and automobile cradles for handheld sets could address the near term need for relative longitude & latitude location of an automobile occupant calling 911. Installing GPS chips in all handsets would greatly increase costs, however, and GPS may not be the best solution for future E-911 designs. In particular, GPS will not be effective for indoor cellular or PCS calls.

In light of the difficult issues raised by the desire to obtain accurate location information, Northern Telecom urges the Commission to convene a negotiated rulemaking committee to select standard solutions from the myriad potential technologies and methodologies.

E. Additional Desired Features

Dialing Requirements

The Commission identifies as another feature access to the correct PSAP by only dialing 911. Northern agrees that future wireless consumer mobiles and handsets should be designed to reach a PSAP by dialing a speed dial key or dialing 911 + send, or possibly even eliminating the need to press the send key.

The E-911 NPRM proposes that such access be available not only to a system's subscribers, but also in the case of roamers and locked sets. Northern Telecom does have some concern with the Commission's proposal that all wireless handsets be able to access E-911. If unregistered or stolen mobiles are allowed E-911 access, then fraud may become a problem. Under this scenario of not validating the call, consumers could keep old or unregistered handsets for emergency purposes (peace of mind) and not pay subscriber fees to the network operators.^{32/}

Bypassing of the validation step also introduces other problems such as fraudulent E-911 mobiles sending the PSAP an invalid Directory Number (DN) or Mobile Identification Number (MIN). In such a case, a real call back number does not exist and will not be provided to the PSAP. Thus, the gray market for old, stolen or unregistered mobiles could impact network operators' business. Northern Telecom believes that the negotiated rulemaking process can best balance the system operators' fraud concerns with the desire to ease access for 911 calls.

Connection to the Nearest PSAP

Connecting to the correct (nearest) PSAP will involve use of a uniform and non-propriety ALI method. Thus, the Commission will need to establish standard location information and formats.

^{32/} For example, such handsets could be acquired at "garage sales" or other similar sources.

Assuming that, in the short term, "nearest" PSAP would be defined in terms of the PSAP closest to the base station handling the 911 call, such a feature could be provided without the need for extensive development effort.^{33/} A standard for selective routing that addresses cell site ID and possibly sector ID would be a feasible approach to providing a minimum location capability that would be common between multiple networks.

Future capabilities that would connect the caller to the PSAP closest to the caller (rather than closest to the base station handling the call) will require significant refinements to the location capabilities of the handsets. In order to ensure a timely, viable and uniform development of this capability, Northern Telecom suggests that this issue should also be referred to the negotiated rulemaking committee.

Northern Telecom is concerned that unless a uniform and non propriety ALI method is utilized, PSAP's may be unable to use the information. Moreover, a lack of uniformity will drive up the costs for everybody. The cost of compliance with E-911 requirements could drive the price of wireless service beyond the

^{33/} It may be necessary to recognize that there may be an "exception" for the limited cases where a caller places a current call on hold and then dials 911 and then also drives into a new cell. In those cases the original cell would continue to control the call as the "anchor" base station due to the original call not having been disconnected, and thus could be the base station used to route to the nearest PSAP. In light of the limited circumstances under which any potential problem might arise, Northern Telecom does not believe that any special development work to address this concern is merited. Northern Telecom believes instead that it would be better merely to understand and acknowledge that there are some limitations inherent in the early method for routing wireless 911 calls to the proper PSAP.

means of many Americans. Northern believes that the E-911 requirements should be designed to provide the best feasible E-911 service, but avoid pricing wireless beyond the means of most Americans. Public Safety also depends upon having a system that is affordable to all that want the service.

Priority Access

The E-911 NPRM also proposes calling priority for E-911 calls from wireless handsets. Northern Telecom agrees that systems should be designed to give E-911 calls priority in routing from the wireless network to the PSAP. Today virtually all wireless systems give priority routing for a received 911 call. Providing RF priority access from the mobile to the base station is more problematic, and thus should be a future "requirement." Northern Telecom suggests that this issue be referred to a negotiated rulemaking for development of a non-proprietary system solution to ensure interoperability throughout the country.

Wireless Labelling Requirements

The Commission has also proposed certain labelling requirements for wireless services. As set forth in the E-911 NPRM, after a short amount of time, equipment that does not meet standards would be labelled as follows:

You may use this equipment to dial for help through 911. The person answering may not know where you are, or how to call you back, unless you accurately provide

your location and your full telephone number, including area and/or roaming codes.^{34/}

Northern agrees that equipment warnings can be an effective and appropriate tool for the Commission to speed E-911 service features to the consumer.

However, Northern believes that consumer warnings need to give clear and accurate information to the general public, and should only be used where appropriate. Northern Telecom is concerned that the proposed labelling requirement may be misleading. A wireless handset may be capable of sending information that complies with E-911 "requirements," but the wireline connection or the PSAP may not be capable of transporting or displaying the information. Thus, the absence of a label may provide a false sense of security.

Further, as noted in the E-911 NPRM, many wireline systems are incapable of providing service equivalent to the wireless "requirements," since over 30% of the country's wireline systems provide only basic 911 or no 911 at all. It would be unfair to impose labelling requirements on wireless systems when equivalent obligations are not imposed on the wireline systems.

To the extent that the Commission believes that labelling is appropriate, Northern suggests the following changes to the proposal in the E-911 NPRM:

1. Equipment labelling should not apply to handsets or mobiles that are capable of sending the required information, although the instructions should warn consumers that not all systems are capable of processing the information.

34/ E-911 NPRM at ¶ 55.

2. It may be appropriate to develop consumer warnings to identify systems that inhibit providing the "requirement" information.^{35/}
3. Consumer education should alert customers of wireless or wireline service providers that do not achieve compliance with "requirements." Warnings could be included on customer bills as one such educational method.
4. Wireless terminal manufacturers should have the option to include a showing of E-911 "requirement" compliance during the type acceptance process. Equipment certified as complying during type acceptance should not be subject to future labelling obligations.
5. Wireline customers that are connected to systems without E-911 capability equivalent to wireless "Requirements" should also receive consumer warnings.
6. The requirement for labelling or consumer warnings should be applicable six months (rather than 30 days) after the final rule is effective.

Northern Telecom believes that these actions will improve the proposals for labelling of customer equipment.

F. Use of a Negotiated Rulemaking

Northern Telecom believes that the best way to resolve the outstanding wireless issues is for the Commission to set "requirements" generally, and let the industry reach agreements on standards and implementation. Northern Telecom believes that the industry can promptly adopt uniform standards to achieve the requirements. Northern Telecom also believes that the negotiated rulemaking process would best achieve this goal.

^{35/} This issue should be referred to the negotiated rulemaking committee to determine whether there is an effective and economical way to provide that information to the caller.

Northern Telecom suggests that the membership should include trade associations, standards committees and public safety organization representatives. In addition, there would be representatives from manufacturers, service providers and the Commission. Northern Telecom believes that such a negotiated rulemaking committee could minimize abuses or delays in promulgating the necessary standards. At the same time, Northern Telecom believes that development of a consensus in a timely manner is highly likely.

G. Proposed Compliance Deadlines
Priority RF Access

Although the E-911 NPRM did not propose specific rule text for wireless services, the Commission did propose some specific obligations and the timeframes for implementation. One such obligation proposed in the E-911 NPRM would require that within one year of adoption of the rules, originating 911 calls must be assigned priority over non-emergency service calls.^{36/} Northern Telecom suggests that the one year deadline be extended, since a uniform solution to permit RF access priority needs to be developed. Northern Telecom suggests that implementation should be keyed to the resolution of this issue by the negotiated rulemaking committee, including the adoption of necessary standards.

^{36/} E-911 NPRM at ¶ 44.

Further, achieving the "requirement" deadline with proprietary systems or equipment should not be deemed adequate for purposes of measuring compliance. For E-911 to be practically and quickly available to the general public, systems must use non-proprietary system design. While proprietary methods exist today that support RF priority access, a common, preferred method has not yet been defined. This is a topic that should be resolved through the negotiated rulemaking process.

Transfer to Nearest PSAP

With respect to timing, the Commission also proposes that within one year of adoption of rules, the wireless network must be able to transfer a 911 call to the PSAP closest to the base station or cell site receiving the 911 call.^{37/} Northern believes that most types of E-911 calls can be routed to the appropriate PSAP in this manner within the time frame suggested by the Commission.^{38/} Providing additional location information to the PSAP presents more complex issues. Presenting the PSAP with both the cell and sector will require the development of standard protocols and formats to ensure that the PSAP can utilize the information.

^{37/} E-911 NPRM at ¶ 49.

^{38/} Compliance for some unique situations may require additional time for implementation. For example, as discussed earlier, there may be some problems if a call to 911 is made while an ongoing call is put on hold. Northern Telecom suggests that the negotiated rulemaking committee could identify any other situations that require special attention, and possible solutions if necessary.

The E-911 NPRM also proposes that within three years, ALI information to the PSAP must include an estimate of the callers approximate location and distance from the receiving base station.^{39/} Northern Telecom believes that it is unreasonable to expect the PSAP's to accommodate information that is delivered in different forms from the many different types of technologies. Therefore, for wireless to start an evolution toward location identification more accurate than Cell location, the manufacturers, service providers and public safety providers need to agree on standards.

However, Northern Telecom is not convinced that the proposed "second phase" is worthwhile. Significant work would be needed to develop the necessary standards. Moreover, the accuracy of the information would be questionable, because of factors such as multipath and fading. Given the complexities for accommodating this interim solution, as well as the relatively small gain in location information that could be provided to the PSAP with confidence, Northern Telecom urges the Commission to delete this interim requirement. Northern Telecom believes that resources would be much better spent seeking the longer term location determination enhancements, since the investment in providing the interim information may not be compatible with the longer-term solutions that are ultimately adopted. Thus, the interim solution is likely in a short time to become a "stranded investment."

^{39/} E-911 NPRM at ¶ 50.

Call Back

The Commission also proposes that within three years of adoption of rules, the wireless networks must provide PSAP attendants with the capability to call back the 911 caller, if the call is disconnected.^{40/} Northern Telecom believes that cellular and PCS systems should be capable of providing the call back number to the PSAP within the three years for most of the system's callers when the call back number for the handset only needs seven digits. Complications occur when the call back number needs more than seven digits, such as the possible need to modify the wireless systems' signalling to accommodate additional information for roamers.^{41/} Although call back information is achievable earlier than three years, it will not be possible to provide both call back information and location information within the three year time frame. Call back and location information will require much more digits of information than the seven to ten digits that can readily be provided by the CAMA system. Standards must be adopted before manufacturers can rationally design systems to send more than seven digits of information for 911 identification and/or location. Such changes will require the adoption of uniform standards.

^{40/} E-911 NPRM at ¶ 52.

^{41/} Seven digit call back numbers may be adequate for local users, but ten (10) digits at a minimum will be needed for roamers.

Through expansion of the number of signalling digits provided to the PSAP by the wireless network, all of the call back information could be presented to the PSAP, including the call back number for roamers. While the network can be configured to handle some additional CAMA digits, PSAP equipment and dedicated trunk equipment connecting to the PSAP may also need to quickly be upgraded to be capable of handling more data regarding the caller in order to accomplish the FCC's goal of providing the call back information. The three year compliance will be difficult, unless universal standards to accommodate the passing of additional information are promptly developed.

Within the Commission's proposed three year period, basic common channel signaling capabilities should be implementable. These capabilities can provide the features requested by the Commission, including some or all of the following being provided to the PSAP:

- Call back number and subscriber's name
- Location of the call origination (ALI)
- Class of service, residence or business
- Base station providers name and telephone number
- Priority of caller (e.g., hospital, school, etc.)
- Routing information to the proper PSAP
- Transfer numbers to police, fire and ambulance

The three year deadline for the capabilities noted above is aggressive. Information received at the PSAP that exceeds seven to ten digits is highly dependent upon individual data base

capabilities, and many 911 systems may be incapable of providing some of the additional desired information coupled with the ANI. In some cases, new standardized parameters will be required to provide the information for those capabilities, which may delay availability beyond the three years suggested by the Commission.

Three-Dimensional Location

The Commission also proposes that within five years of adoption of the rules, a wireless network provide the PSAP with three-dimensional location within a radius of no more than 125 meters (and possibly more precise).^{42/} Thus, the network would have to send latitude, longitude and elevation of the handset. As noted above, the industry needs uniform standards promptly to achieve this "requirement" deadlines.

At this time there is no universal solution to provide 3-D location capabilities.^{43/} There are niche solutions but each has limitations. Northern Telecom is optimistic that the proposed negotiated rulemaking committee could identify the best overall solution for wireless E-911, that will provide the general public with effective and economical E-911 services.

Obtaining this 3-D information could prove to be very expensive, however. Northern Telecom is concerned that the cost of universal E-911 "requirements" could so significantly increase

42/ E-911 NPRM at ¶ 51.

43/ Northern Telecom is aware of some 18 possible technologies and eight RF access methods, or some 144 combinations to be considered.

the price of wireless services that the service would be beyond the financial resources of most Americans. Access to 911 services, or "peace of mind", is a dominant motivation to acquire wireless services. There is a need to improve the connection functions between wireless 911 callers and nearest PSAP. However, system improvements should not result in such increased costs that the most Americans cannot afford to subscribe to a wireless service. Northern Telecom suggests that the Commission defer to the negotiated rulemaking committee, rather than imposing in advance a deadline for implementation of this requirement.

Equipment Requirements

In order to ensure compatibility, the Commission proposes to prohibit manufacture, importation or sale of non-compliant equipment at a future date.^{44/} Prohibiting the manufacture, importation, or sale of non-compliant equipment must be used carefully to avoid conflicting results. Today there is no universal solution to evolve to the functional equivalent of wireline E-911. However, wireless services, even with their limitations, are bringing new 911 connection for many users in locations where the best wireline E-911 system could not service the person in need.

Improving the capabilities of wireless 911 is not dependent only upon manufacturers of wireless systems and wireless system

^{44/} E-911 NPRM at ¶ 55.

operators, but is also dependent on the capabilities of the other "links" in the E-911 chain. Improvements by the PSAP and dedicated trunk systems are also needed to reasonably achieve the functional equivalent of wireline E-911 services.

One of the goals articulated by the Commission is to prevent early obsolescence of PSAP equipment. Northern Telecom does not agree that the Commission's Rules should necessarily avoid improvements even where early obsolescence of some PSAP equipment may result. Northern Telecom believes that improvements to PSAP equipment, and improvements to dedicated lines and switches to the PSAP, must be part of the solution.^{45/}

Today the dedicated lines and switches connecting a PSAP with a wireless, wireline, or PBX call are designed to primarily service analog transmissions and eight digits of information. New wireless systems will need early capacity for 20 to 100 digit messages into the PSAP to provide the desired additional information. The existing trunks to PSAPs will not be able to accommodate such large numbers of digits. Some upgrade of these trunks can be done to transfer 15 to 20 digits (as suggested in Section II), however SS7 network and ISDN interfaces to PSAPs will be required to accommodate the larger information transfer.

Given the need for the different development work, import or sale prohibition milestones should not be set until the standards and PSAP/dedicated trunk access issues are resolved. Only after

^{45/} Funding the improvements is an issue that must be addressed to make the improvements reasonably and quickly available.

these issues are resolved will it be feasible for manufacturers to provide reasonable estimations of the time necessary to design systems and customer equipment that will meet the "requirements" for wireless E-911 service.

H. Funding Issues

There are other issues that were not addressed by the Commission in the E-911 NPRM. Northern Telecom suggests that some of these issues may also appropriately be referred to a negotiated rulemaking committee. Funding is one such issue. Wireline LEC's do not provide E-911 for free. A monthly surcharge is typically added to every subscriber's monthly telephone bill to fund wireline E-911 services. In addition, the LEC may bill cities or PSAPs for maintenance.

For wireless to provide the functional equivalent E-911 access as wireline, wireless networks presumably will also need revenue sources. In the wireless area, the funding is complicated by roamers' use of the system. Northern Telecom notes that a fee structure, or revenue system typically compensates the LEC and the PSAP for providing E-911 services. Northern Telecom believes PSAP improvements will be necessary, and that improvements to the dedicated trunks connecting the PSAP will be necessary. The Commission should consider addressing funding issues through the negotiated rulemaking to avoid hardships to PSAP providers.

VII. CONCLUSION

Northern Telecom fully supports the goals of this proceeding -- to enhance the compatibility and utility of 911 services as new technologies are deployed. Dispersed private telephone systems such as PBXs should provide information to the PSAPs that will allow them automatically to determine the identity and location of the individual station calling 911. Similarly, for wireless services such as cellular and PCS, the PSAP will be able to call back the mobile unit and will have a better idea of the caller's location.

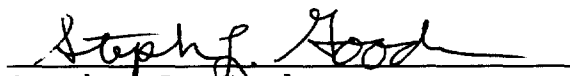
As detailed in these comments, in order to fully achieve the Commission's goals for E-911, much work needs to be done. With respect to some aspects, implementation can occur rapidly. With regard to other proposed changes, however, requirements need to be defined, standards need to be developed, equipment needs to be modified, and advanced capabilities need to be deployed.

Northern Telecom believes that a negotiated rulemaking committee is the best procedure for laying the groundwork to accomplish these tasks in a timely manner. Northern Telecom also believes that a negotiated rulemaking committee can best balance the costs and benefits of the various proposals.

Given the magnitude of the effort required, some additional time beyond some of the milestones suggested by the Commission may be necessary. Northern Telecom believes the time will be well spent, however. Through the continued work of manufacturers, telephone service providers and emergency services

providers, a better E-911 service can emerge. Northern Telecom believes that such an enhanced E-911 capability will well serve the public interest by helping to save lives and property. Northern Telecom thus urges the Commission to proceed in the manner detailed in these comments.

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